

## CLAIMS

What is claimed is:

1. An apparatus for acquiring a waveform, comprising:
  - means for performing a Fourier transform on a sampled waveform;
  - means for providing a power spectrum of the Fourier transformed waveform;
  - means for estimating a signal-to-noise ratio based upon the power spectrum of said power spectrum providing means;
  - means for determining whether the signal-to-noise ration is less than a threshold value;
  - means for accumulating the power spectrum of said power spectrum providing means when said determining means determines that the signal-to-noise ratio is not less than the threshold value; and
  - means for estimating a symbol rate of the waveform based upon a power spectrum accumulated by said accumulating means.
2. An apparatus as claimed in claim 1, further comprising means for setting a sampling rate for sampling the waveform based upon the symbol rate estimated by said symbol rate estimating means.
3. An apparatus as claimed in claim 1, further comprising means for estimating the Doppler of the waveform based upon a power spectrum accumulated by said accumulating means.
4. An apparatus as claimed in claim 1, further comprising means for estimating the Doppler of the waveform based upon a power spectrum accumulated by said accumulating means, and means for tuning a center frequency of the waveform based upon the Doppler estimated by said Doppler estimating means.

5. An apparatus as claimed in claim 1, further comprising means for estimating the Doppler of the waveform based upon a power spectrum accumulated by said accumulating means, and means for tuning a center frequency of the waveform based upon the Doppler estimated by said Doppler estimating means wherein the waveform is centered at 0 Hz.

6. An apparatus as claimed in claim 1, wherein the waveform is a continuous-phase modulation waveform.

7. An apparatus as claimed in claim 1, wherein the waveform is compliant with a MIL-STD-188-181B standard.

8. An apparatus of determining the start-of-message of a waveform, comprising:  
means for normalizing samples of a sampled waveform;  
means for correlating the normalized samples with known start-of-message samples to provide a correlation output;  
means for storing a magnitude value of the correlation output;  
means for adjusting the magnitude value of the correlation output to reduce an effect of a sync pattern of the waveform on the magnitude value of the correlation output;  
means for determining whether the adjusted magnitude value of the correlation output exceeds a threshold value; and  
means for detecting a correlation peak wherein the start-of-message of the waveform is determined.

9. An apparatus as claimed in claim 8, said correlating means correlating additional samples to assure that said correlation peak detecting means detects a proper peak.

10. An apparatus as claimed in claim 8, further comprising means for computing a carrier phase of the waveform at the start-of-message determined by said correlation peak detecting means.

11. An apparatus as claimed in claim 8, wherein the waveform is a continuous-phase modulation waveform.

12. An apparatus as claimed in claim 8, wherein the waveform is compliant with a MIL-STD-188-181B standard.

13. An apparatus for acquiring a waveform, comprising:  
means for searching for a preamble of the waveform;  
means for detecting the symbol rate of the waveform;  
means for estimating the Doppler of the waveform;  
means for detecting the start-of-message of the waveform; and  
means for estimating an initial carrier phase of the waveform.

14. An apparatus as claimed in claim 13, further comprising means for detecting the header of the waveform, and means for decoding the header of the waveform.

15. An apparatus as claimed in claim 13, said means for searching for a preamble including a sample buffer structure, a fast Fourier transform processor structure, a power spectrum detector structure, an accumulator structure, and a spectrum analyzer structure.

16. An apparatus as claimed in claim 13, said means for detecting the symbol rate including a sample buffer structure, a fast Fourier transform processor structure, a power spectrum detector structure, an accumulator structure, and a spectrum analyzer structure.

17. An apparatus as claimed in claim 13, said means for estimating the Doppler including a sample buffer structure, a fast Fourier transform processor structure, a power spectrum detector structure, an accumulator structure, and a spectrum analyzer structure.

18. An apparatus as claimed in claim 13, said means for estimating the start-of-message including a sample buffer structure, a correlator structure, and a decision logic structure.

19. An apparatus as claimed in claim 13, said means for estimating an initial carrier phase including a sample buffer structure, a correlator structure, a decision logic structure, and an arctangent calculator structure.

20. An apparatus as claimed in claim 13, wherein the waveform is a continuous-phase modulation waveform.